



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## MUSHROOMS.\*

BY JOHN L. RUSSELL.

---

A PLEASANT little treatise on some of the more prominent species, and one well adapted to afford just such information as those who are not strictly botanists might need.

Some faint idea of the immense number of these obscure but interesting plants may be obtained from the title-page of the Rev. M. J. Berkeley's "Outlines of British Fungology, containing the characters of above a thousand species, and a complete list of all that have been described as natives of the British Isles." (London, 1860.) Of these 1,000 are large and conspicuous, and 1,406 are smaller and even minute, of which the species of *Sphæria*, alone which speck the leaves, and fruit of various plants in Great Britain, are 203 in number. In Fries' great work on the species of a single family, the Hymenomycetes, we find an enumeration and description of 2,545, embracing, for the most part, the larger kinds known to him in various regions of the globe. (*Epicrisis*. Upsaliæ, 1836-38.) In the year 1831, Lewis D. de Schweinitz communicated to the American Philosophical Society; Philadelphia, a list of 3,043 species of fungi which came under his observation around Bethlehem, Pennsylvania. The list has been greatly enlarged since by the labors of Curtis, Ravenel, and other botanists in the Southern States, and by the collections of various individuals at the North.

The singularly varying forms, under which many of the Fungi appear, have given rise to species which farther research has reduced to some previously described. Abroad, the researches of the Tulasnes are elucidating this branch of the subject, and exhibiting most interesting details, and new as well as novel fields of investigation await the Ameri-

---

\* A Plain and Easy Account of the British Fungi, etc., etc. By M. C. Cooke. With twenty-four colored plates. 12mo, pp. 148. London, 1862.

can botanist who will reduce to practical results a series of observations requiring a lifetime to acquire.

In view of the extent of our subject, the treatise before us can be regarded as no more than a brief and meagre account of some of the few and more prominent species which might occur to a beginner in such districts of England as are fertile in species. But it is to be regretted that the American press is not as generous in contributions to knowledge in the various departments of natural history as is that of the mother country. Just such a cheap and prettily illustrated treatise, which should be strictly American, would do a great service, and would be what many young persons need. There seems no good reason why the fantastic and gorgeous creations of the fungi, which deck our woods and spring up around our dwellings, or are found in our pastures, should not be studied and as well known to the young, as are the blue flowers of the *Hepatica*, or the rosy corols of the *Mayflower*, or the first *Violets* and the *Saxifrage* and *Columbines*, which annually awaken a vernal zeal for botany, but which fades and fades away on the coming heats of June, or the sultry days of August. Who has not admired the *Agarics* and *Boleti* and *Clavarias* in the pine woods in September, and who has not longed to know something more of them, to learn their names, their good or bad qualities, their uses or ends? The brilliant scarlet disk of a *Peziza*, starting into life from beneath the dead leaves of a *Pennsylvania* wood, takes me back now to the vicinity of *Pittsburgh*, where years ago I searched for the *Erigenia*, the first blossom of the spring there; and there is no autumn which does not thrill me with a new life as I see the shady paths and the wet-spots of *Cat Swamp* so bravely adorned with these fugitive and fugacious forms of vegetation.

The excitement which spurs on many a student in natural history, that he may be the possible finder of a *new* species, is coincident with the study of the fungi. Spots most familiar to the eye, often are found producing kinds either

quite novel, or at least of occasional occurrence. Dependent as it would seem on some atmospherical conditions, species of fungi are meteoric, and visit places which seem quite singular and remarkable. Some extraordinary specimens of the exquisite Morel (*Morchella esculenta*) were found in the coal cinders in the rear of the Eastern Railroad depot, by the late Mr. Knights, a worthy employee there. Occasionally I have seen it in old orchards, but should scarcely have supposed it the product of cinders. The beautiful *Cyclomyces* was first discovered many years ago in Tewksbury, in this State, by Dr. B. D. Greene, and found to be entirely unknown before, though subsequently occurring elsewhere. I look for the possibility of the appearance of the truffle in some sections of the limestone strata of the United States; and other wonderful and beautiful sorts are only waiting to be found.

The value of the larger fungi as articles of food is scarcely known and hardly appreciated in this country. The table recognizes them chiefly in the presence of ketchup, made of species indiscriminately gathered by those who prefer this article or sauce. It is probable that a few only are really deleterious and poisonous, and even these are rendered comparatively innocuous by heat and spices. Otherwise than this they are rather objects of prejudice, and most persons look upon them with disgust. Even for their mere exterior beauty they are seldom sought, and still less are they employed for ornament, like their equally fugacious and soon-fading sisters, the many sorts of wild flowers which decorate the parlor. I have, however, seen them gathered and arranged for this purpose, and with singular effect; and the interest such groups, exhibited at the Horticultural Society Rooms in Boston, elicited was worthy of remark. The number of the Agarics described by Berkley in his "Outlines" is 564, as found in England, yet scarcely more than a single species, the *A. campestris*, is made an article of food. This species is represented in this country, and when cooked is

certainly a pleasant morsel. The Rev. Dr. M. A. Curtis, in his Catalogue of the Plants of the State of North Carolina (Geological Report), 1867, gives 438 species of Agarics, of which he considers fifty-six as esculent. In Poland and Russia even such abstemiousness is unknown, and most kinds of the larger fungi that occur are employed for food by the common people, either in a dried state, or after pickling in salt or vinegar. That there are highly poisonous qualities resident in several is indisputable, and is well known, as has been shown by Christison and others; one being an acrid matter so very fugacious that it disappears when the plant is dried or boiled or macerated in weak acids, alkalies, or alcohol; the other principle is more fixed, resisting the action of these tests, and resembling in its effects the operation of opium.

Many years ago, Greville, in a Memoir before the Wernerian Society of Edinburgh, directed the public attention to the use of the esculent fungi as a staple article of diet; and Schwaegrichen, the illustrious editor of Schweinitz's first contribution to the knowledge of our North American species, derived great satisfaction in eating those which possessed neither a bad flavor nor a disagreeable smell, and which had a tolerably firm consistence, with bread and drinking nothing but water; such a diet pursued for several weeks, as he affirms, increasing his strength and improving his health. "I have observed," says Persoon, who furnishes this account, "that fungi, if moderately used, are very nourishing." The experiments of Braconnot and Letellier detected a substance to which the name of *fungin* is applied, present equally in the harmless and poisonous fungi alike, which in itself is highly nutritious containing nitrogen, and very similar in its composition to animal matter. The process of cooking is therefore conducive to the gustatory condition, and advantageous in overcoming what is deleterious, if present in species considered esculent. A more general as well as accurate knowledge of our native species would place these despised

plants on the same level with other and higher forms, which embrace among our garden vegetables wild states of several equally poisonous and of many plants beside, often mistaken for harmless ones, ending, if used, in fatal results.

About eight years ago appeared the Rev. Dr. Badham's valuable work on the "Esculent Funguses of England," with drawings of the species colored after nature, and defining their localities, uses, and importance; indicating attention in the right direction to this subject, and followed shortly after by the little treatise whose title stands at the head of this article. To understand the arrangement and classification of the fungi requires a careful study of the systematic treatises of such botanists as have made them a specialty, and to give even an idea of such systems would be out of place here. Yet some peculiarities noticed by our author may not be wholly devoid of interest. "To say that fungi may be found everywhere, would not perhaps be literally true; but to say where they are *not* found under any circumstances would be puzzling,—every rotten stump or twig, every decaying leaf or fruit, has its peculiar species,—some large enough to attract immediate attention, others so small as to be invisible to the unaided eye." (p. 3.)

Of these latter may be mentioned, as confirmatory of this statement, the parasitic fungus, which destroys by a slow consumptive disease the life of the common House-fly (*Sporendonema musca*); and the *Botrytis bassiana*, which infests the silk-worm; the mother of beer and vinegar is the mycelium\* of other species; and similar mycoderms\* riot in the inkstand, and even in pharmaceutical preparations; the decaying hoofs and horns of animals, and the feathers of birds produce their particular kinds; the lungs of water-fowl are attacked by others; the skin of fishes, and the eggs of toads and frogs are destroyed by parasitic fungi. No substance escapes their visits, and even iron hardly cooled has been found invested in a few hours with fungoid threads. The

---

\* Conditions of fungi in open or matted threads, from which mouldiness often springs.

minute organisms, which serve for seeds and known as spores, float in the air and lodge in the water, waiting opportunity to germinate and grow. Even the cavities of nuts, and the tough kernels of apples develop certain species; and roots and solid timber alike are rent asunder by the presence of particular kinds. The mildews which cover our gooseberries and hops, and the foliage of the vine, or the husk of the ripening grain, are forms of the smaller fungi, and all powerful in their littleness.

"Nor are these plants less worthy of notice on account of the rapidity of their growth. The great puff-ball springs up in a marvellous manner to the size of a pumpkin during the night, and Dr. Lindley has computed that the cells of which its structure is composed have multiplied at the extraordinary rate of sixty millions in a minute. Dr. Greville mentions an instance of one of the largest of British fungi (*Polyporus squamosus*) attaining a circumference of seven feet five inches, and weighing thirty-four pounds after having been cut four days. It was only four weeks attaining to these dimensions, thus acquiring an increase of growth equal to nineteen ounces per day." This rapidity of growth is only equalled by the amazing power which vegetables, so fragile and tender in their tissues, possess; instances being cited where pavements have been lifted by the growing of fungi beneath; but somewhat of the same phenomena may be yearly seen in the woods, where clusters of brittle fungi, by perpendicular pressure, lift masses of earth and leaves upwards as they issue into the air and light; and in the early spring the same phenomena may be seen where the flowers of the Christmas-rose penetrate the frozen ground.

"It is a curious fact in connection with the growth of these singular plants" (the fungi), "that while Phanerogams absorb carbonic acid from the atmosphere and respire oxygen, in this instance the order is reversed, and carbonic acid gas is given off. Fungi appear to flourish best in the absence of light, in dark cellars, under flag-stones, in hollow trees and

in like places, where no other form of plant could exist; while some are entirely subterranean. The *forms*, too, which these singular plants assume are extremely diversified; in some the form is that of a cup, in others of a goblet, a saucer, an ear, a bird's nest, a horn, a bunch of coral, a button, a rosette, a lump of jelly, or a piece of velvet. In color they are almost as variable as in shape, the rarest color being green. We have all shades of red, from light purple to deepest crimson; all tints of yellow from sulphurous to orange; all kinds of browns from palest ochre to deepest umber, and every graduation between pale gray and sooty black; blue and violet tints do not abound, but these, as well as a beautiful amethyst, occasionally occur. White and creamy traits are very common. Odors are manifestly agreeable or disagreeable to a considerable extent, according to the taste of the inhaler, but it must be confessed that some of the fungi exhale an odor so intolerably fetid, that no set of olfactory nerves could be found to endure it longer than was absolutely necessary; the truly elegant but rare *Clathrus* being an instance to the point. Fortunately this unpleasant feature is not common in the fungi, some smelling like new-made hay, like violets, like anise, or walnuts, or new meal, or tarragon,—and a variety of flavors which the fungi possess is calculated to please.”

It has been asserted by some botanists that climate greatly modifies the properties of these plants, and renders them harmless, where found out of their native habitats. A magnificent species, known as the *Amanita muscarius*, or Fly Agaric, a native of Europe, and found in our woods, is one of twelve species occurring in England, of which many beside this one, are decidedly poisonous and used in the preparation of fly-paper. Roques, in his work on the esculent fungi, distinctly says, “That this plant has not its poisonous qualities modified by any climate, the Czar Alexis lost his life by eating of it, and yet it has been affirmed that in Kamtschatka it is used as a frequent article of food, and is



cooked and eaten in Russia. In Siberia, it supplies the inhabitants with the means of intoxication similar to that produced by the *haschisch* and *majoon* in the East."

Under the vague and general name of mushrooms, several species of fungi are consumed as articles of food. It may be true that in some localities, only one or two species are dignified with the appellation of mushroom, while all the rest which resemble it in form are condemned as toadstools: yet we believe there is in prospect an age when more of those which are really worthy will be admitted to the tables of rich and poor without that accompaniment of suspicion and dread which attaches to a dish of mushrooms. We accord perfect justice to *Agaricus compestris*, the mushroom of cultivation, whilst more delicious kinds, and equally harmless, are allowed to flourish and decay year by year without molestation.

Dr. Badham, whose work we have already mentioned, gives us instances of "beefsteaks growing on oaks in the shape of *Fistulina hepatica*; *Agaricus fusipes* to pickle in clusters under them; puff-balls, which some of our friends have not inaptly compared to sweetbread for the rich delicacy of their unassisted flavor. *Hydna*, as good as oysters, which they somewhat resemble in taste; *Agaricus deliciosus*, reminding us of tender lamb kidney; the beautiful Yellow Chanterille, the *Kalon kai agathon* of diet, growing by the bushel; the sweet nutty *Boletus* in vain calling itself *edulis* (edible), where there was none to believe; the dainty *Orcilla* (*Agaricus heterophyllus*), which tastes like the crawfish when grilled; the red and green species of *Agaricus*, to cook in any way, and equally good in all."

Of this list of dainties let us see what we have among us wherewith to replenish our larder. The beefsteak (*Fistulina*), though not given in my friend Sprague's second list of New England fungi, in the Proceedings of the Boston Society of Natural History, vol. vi, p. 315, is credited to D. Murray in a previous list of the fifth volume, p. 325; and

according to Schwinitz, is common throughout all Pennsylvania, and often of the greatest size. We must forego the pickled *Agaricus fusipes*, unless brought to light by Curtis or Ravenel; the creamy puff-balls, which in the *Lycoperdon giganteum*, is, according to our author, excellent eating, especially esteemed in Italy, and on the authority of Mrs. Hussey (author of a costly work on British Mycology) are, when sliced and "dipped in the yolk of egg, and sprinkled with chopped meat, herbs, and spices, much lighter and more digestible than egg omeletts:" these rare bits are represented in the *L. Bovista*, which attains an enormous size, and would furnish "omelets" for an army. Then for vegetable oysters we have several species of *Hydna*: the lamb's kidney in pine woods is the *Lactarius* (or *Agaricus*) *deliciosus* and the *volemum* is in Mr. Sprague's list, a more common species; as to the "beautiful yellow Chanterelle," which smells like ripe apricots, a bright sunny afternoon in September revealed such a group to my eyes as has gladdened them ever since when my memory has recalled the scene; the edible *Boletus*, if not among our native species, is curiously represented by some counterfeit, and, according to C. C. Frost, occurs in the woods of Brattleboro', Vermont; the dainty *Orcella*, I am sorry to say, is found in bad company with species of *Russula*, and no matter if wanting with us, a genus containing "some of the best and some of the worst of fungi viewed in an alimentary aspect, and some of the most brilliantly colored species."

Our author gives us quite a list of species not uncommon in England, some sold by the quantity in the markets with their true scientific names, without which they could not be recognized with any degree of certainty. In a few instances we have been able to identify them with American kinds, by comparing reliable catalogues of our own mycologists; but even this method is not without certain objections, since by the united labors of Berkeley and Curtis, the Schweinitzian collection has been found not so authentic as it could be

wished. The student, curious in these matters, may be referred to these papers in the Journal of the Academy of Natural Sciences of Philadelphia, for July, 1856 (new series), and to those in the Memoirs of several Scientific Societies, and to Dr. Curtis' list of plants alluded to above. But in an enterprise like the one before us, the efforts of gastronomy must be enlisted, and a series of experiments instituted upon our New England species. Plants thus low in the order of vegetation would be most likely to be represented by co-species and transatlantic forms, equally good for food or dangerous as viands, possessing the chemical principles which are to be sought and found in them.

The fairy-rings, described in English books, are due to the presence of a modest little Agaric, figured and colored to life, under the name of *Marasmius oreades*, an appellation which we find in Mr. Sprague's list, but with which we have no personal acquaintance. "The little fairy-ring Champignon," says M. C. Cooke, "is one of the privileged few that enjoy a good reputation, but even in this instance the reputation is local. In the dried state they are available for culinary purposes, while thousands of them annually rot in the pastures, where they grow without a hand to gather them. There is scarcely a more delicious fungus. It is so common in districts that bushels may be gathered in a day. They may also be readily dried by stringing them together on a thread, and suspending them in a dry kitchen, and when thoroughly dried may be kept in close tins."

Allusion has already been made to the *Boleti* as articles of food, of which both England and this country possess many species. In selecting them for trial in cookery, we are informed that "it will be advisable to caution all who are inexperienced in collecting Boleti, that several are unwholesome, some decidedly poisonous. If upon cutting or bruising any specimen it should be found to change color, it should be rejected. Some species become blue almost immediately upon wounding; those with reddish stems, or

with the under surfaces red or crimson, should also be rejected."

Any one familiar with our woods in the autumn must recall the numerous sorts of the coral fungi, so delicate and branched in variety of shapes, as to remind him of the corals of the ocean. They bear the generic name of *Clavariæ*, from *Clavus*, a club, the single branches being blunt or club-shaped at the apices. If such on being gathered and carried home are laid upon a piece of slate or black paper, a multitude of small white particles, or perhaps of a bluish-gray color, will fall from them, and become visible after a few hours. These are the *spores*. "All the white-spored *Clavarias* are wholesome; but some are so tough and leathery, and others are so small, that the number at all available for culinary purposes is limited. They should, after being collected, be washed in lukewarm water and perfectly dried, then tied together in little bundles like asparagus, and cooked with butter, parsley, onion, pepper, and salt; when cooked, they may be improved by the addition of a little cream and the yolk of an egg."

The English and European species cited are *C. C. cinerea*, *amethystina*, *rugosa*, *vermiculata*, *fastigiata*, *coralloidea*, and *cristata*, of which we have several, and representatives of the others. The *Helvellas*, like the *Morels*, to which allusion has been made, are also classed among the edible kinds, and represented in our country in two more species at least. "The best substitute for the expensive *Morels* may be found in two indigenous species of *Helvella*, which, like the *Morels*, may be gathered during the season, and dried, and thus preserved for use all the year round. They impart an excellent flavor to gravies and soups." Related to these, but of different shape, size, color, and consistence, are the numerous *Pezizæ*, of which the list of North American exceeds at least two hundred species; and in Great Britain one hundred and thirty or more. They are interesting to the mycologist, presenting in their exterior both delicate and gorgeous tints,

varying much in size, and found almost everywhere in moist situations. "In the manufacture of the handsome Tunbridge ware, a variety of wood is employed under the name of green oak. Although of a mineral green color, this is the ordinary British oak; but the alteration which it has undergone is due to the presence of a fungus. A handsome little species resembling a *Pezizia* traverses with its mycelium the whole fabric of such wood, and these minute threads give the green tint to the timber." Similar tinted but decayed sticks and pieces of timber may be found in our own woods, owing doubtless to a similar cause.

In conclusion, it is to be hoped that the coming season may be seized upon for collecting, delineating, and coloring from living specimens some of the many fine and curious species of this vicinity; and that our naturalists may institute experiments, aided by the chemist and the gastronomer, in this line of wholesome, novel, and dainty tidbits of the table.

---

## SPONGES.

BY A. HYATT.

---

AMONG the dark-brown leaves and green filaments which are borne upon the edge of the incoming tide, one frequently observes a substance hardly distinguishable from the surrounding plants, except for its light-brown color and porosity. This is sometimes dendritic,\* with lank branches springing from broad, thick-spreading bases; but generally it is broken into fragments, and only the palm-like parts, with their finger-shaped ends, are left grasping among the froth-covered sea-weeds. A slight pressure will expel the water, and the aspect of the half-dried specimen will at once arrest attention.

It is in fact a Sponge, differing only in the details of its

---

\* Branching like a tree.